

THE IMPORTANCE OF TAXONOMY AND MUSEUMS IN THE 1990S

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Much of the basic research on taxonomy is carried out in museums, traditional primary sources of information on species. Museums are characterized by their collections — archival holdings of organisms, field and historical data associated with those organisms — and library facilities, usually in volumes far beyond those available to individuals in other kinds of research laboratories. These characteristics of museums can only increase their value and the importance of the roles they play in the future, given our critical need to understand our environment and its components, especially species. Some problems facing museums are discussed, and illustrations of some of the kinds of research carried out at museums are given from ongoing research on geryonid crabs. □ *Museums, taxonomy, systematics, biodiversity, funding.*

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Systematics or taxonomy is the study of natural diversity, better known today by the catchword biodiversity, thanks to the efforts of E.O. Wilson and others (Wilson, 1985, 1988; Black *et al.*, 1989), and it is the kind of research characteristic of museums. Systematic research is basic to any other kind of biological study involving species, whether it be fisheries or molecular biology, ecology, behaviour, or zoogeography.

In the 1990s we seem to have reached the point where both individuals and organisations outside the systematic community, including environmentalists, legislators and sources of research funding, recognise the fundamental importance of knowledge of species diversity, museum collections which represent baseline data over time, and traditional systematic work, and appear to be beginning to appreciate the need for museum collections and systematics more than at any time in the history of systematic research, a time period spanning almost 300 years. Museums and the systematic profession in general, instead of being prepared for such a momentous change, are facing a crisis: we appear to be losing systematists and systematic organisations, including museums.

Part of the problem is that the science of systematics has never been accorded the stature it deserves among all sciences. 'Strange as it may seem, there is less attention and regard paid to systematic work at the present time than ever before.' This is not a quote from an editorial published in 1990 in 'Science' or 'Nature'. It was published by Waldo Schmitt in 1930, and it is just as valid today, 60 years later.

Further, even though museums are primary sources of information on species and even though we are in the 'information age,' automation of museums's major sources of information on species, their collections and their libraries, lags a generation or more behind current technology. Any major department store chain has in its data inventory specific information on individual items of clothing, such as a pair of slacks, including size, fabric, colour, manufacturer, and location. This volume of information on species of shrimps, even commercial shrimps, is generally unavailable from any museum collection, large or small, in machine retrievable form. Even grocery stores routinely use bar-code technology to check-out groceries and prepare bills (invoices). Museums prepare invoices the old fashioned way, as our ancestors did, by hand. The technology needed by museums has existed for years. The funding and the expertise needed to implement the technology is not yet available to most museums, which in consequence are unable to manage the vast amounts of information on species available to them.

In the past 30 years we have seen a dramatic increase in numbers of recognised species of crustaceans, especially in decapods, results of the work of a generation of specialists. In geryonid crabs, for example, specimens identified with *Geryon affinis* Milne Edwards and Bouvier and *Geryon quinquedens* Smith now have been assigned to at least 18 different species. Although this may not be true for other crustacean groups, we are about to lose a generation of giants in decapod crustacean systematics. The

list of decapod specialists now retired or near retirement includes Fenner A. Chace, Jr., Michèle de Saint Laurent, Jacques Forest, John Garth, Janet Haig, Horton H. Hobbs, Jr., L.B. Holthuis, R.W. Ingle, S. Miyake, Isabel Pérez-Farfante, Austin B. Williams, and John Yaldwyn. When Ingle retires next year, the British Museum will have one crustacean specialist on its staff, Geoffrey Boxshall; it will be without a decapod specialist for the first time this century. The Japanese crab specialist, Tunc Sakai, passed away several years ago, as did Richard Bott, Ch. Lewinsohn, and Raoul Serène.

There appear to be few replacements available for these specialists, all of whom worked at the regional or international level. There are many decapod specialists today who work at the national or local level, and perhaps we are seeing a trend away from a few specialists working world-wide to numerous specialists working nationally. This trend could result in more pressure on museums to provide information on the literature as well as on species.

Not only are we losing people, including many great systematists, we are losing institutions. The Allan Hancock Foundation, one of the large, active museums in the United States with a long tradition of research, is in the process of transferring its crustacean collections to the Los Angeles County Museum. The British Museum is de-emphasising monographic work and work on local faunas, even though one of its new areas of emphasis is biodiversity. The government of New Zealand has disestablished the biosystematics programme of the New Zealand Oceanographic Institute, leaving Des Hurley and Elliot Dawson without jobs.

One bright spot is here in Australia, where the Australian Biological Resources Study, now in its 10th year, anticipates a 12.5% budget increase for 1990 (ABRS, 1990).

A wide variety of reports on the needs in and importance of systematics, prepared for a variety of organisations over the past four decades (Anonymous, 1953, 1968; Mayr and Goodwin, 1956; Michener *et al.*, 1956; Steere, 1971a, 1971b; Stuessy and Thompson, 1981; see also Brusca, 1990), all have common themes. Systematics is important, there aren't enough trained systematists, systematics as a discipline ranks somewhere under flatworms in importance, and museum collections need more support. Yet the situation may be worse today than in 1953.

I don't pretend to have the solution to this

dilemma, but I do know it will take an effort to raise the level of understanding of the fundamental importance of systematics, a much higher level of funding than is now available for systematics and collections, the development of national and international forms of recognition for systematic work, a cooperative effort by those in academia and museums to interest people in systematic fields and to train them, and some long-range planning by museums, planning that includes training and jobs for future generations of systematists. Unless the effort includes creating permanent jobs in systematics, including many more support positions, the situation will not improve. Karl Schmidt (in Anonymous, 1953) made many of the same points in an article published in 1952, and noted that E. Ray Lankester had made them in the 1880s.

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